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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,184	03/24/2005	Takahiro Horiguchi	268669US26PCT	4352
22850	7590	08/11/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER MACARTHUR, SYLVIA				
ART UNIT		PAPER NUMBER		
1792				
NOTIFICATION DATE		DELIVERY MODE		
08/11/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/529,184

**Applicant(s)**

HORIGUCHI ET AL.

**Examiner**

Sylvia R. MacArthur

**Art Unit**

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 May 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 5-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-3 and 5-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 24 March 2005 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SF-08)  
Paper No(s)/Mail Date 7/25/2007  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/27/2008 has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-3 and 5-12 have been considered but are moot in view of the new ground(s) of rejection. The amendment to claim 1 reciting the gas injection nozzle and remote plasma part necessitated the introduction of the prior art of Shamouilian et al (US 6,440,221) which teaches gas supplied at all four sides of the reactor (top, bottom, left, and right sides), the remote plasma parts are discussed in col. 4 lines 35-67. The discussion of a plurality of injection openings necessitated the introduction of the prior art of Hillman (US 5,997,649) which teaches a showerhead having a plurality of injection openings.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 5 and 6 recite the limitation "the transparent case" in line 2 (claim 5) and line 3 (claim 6). There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 5-12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyama et al (US 5,651,827) in view of Shamouilian et al (US 6,440,221) and Nath (US 4,149,086).

Regarding claim 1: Aoyama et al teaches a processing vessel (chambers as illustrated in Figs. 3,5,6,9,10,12, and 14-16, a gas injection nozzle unit 8, an opaque case (liner) see abstract and col3 lines 35-64, a heater portion 30a, a holding member (susceptor 7), and a rotational drive means.

Figure 3 of Aoyama et al depicts lamps used as external heaters, but fails to teach that the lamps are a source of UV light. Aoyama et al further fails to teach a remote plasma part.

The prior art of Shamouilian et al teaches a PECVD chamber with a gas supply provided at all four walls, namely the top, bottom, left, and right sides. Col. 3 lines 54 suggests

that quartz could be used a material of construction of the chamber. According to col. 4 line 35-col. 5 line 60 a RF power source, electrode, and an antenna 125 act as plasma generators. The prior art of Shamouilian et al reveals that it conventional to provide such generators to create a plasma of the process gas. Col. 7 lines 1-11 reveals that radiant lamps are used to provide greater temperature uniformity and faster and more responsive control over temperature fluctuations inside the chamber 25. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide a remote plasma part as taught by Shamouilian et al in the apparatus of Aoyama as an alternative mode/design of processing.

Though tungsten halogen lamps are taught as the suggested type of lamps in Shamouilian et al, it has not been specifically taught that these lamps are a source of UV.

The prior art of Nath teaches in the abstract that the tungsten lamps are a source of UV. According to col2 lines 10-52, these halogen lamps provide sustainable heat and do not require heating times as many other lamps. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the apparatus of Aoyama et al as modified by Shamouilian et al to use the preferred tungsten lamps as they are a known source of UV according to Nath.

Regarding claim 2: See Figure 6 holder portion as used within the reactor of Figs. 9 and/or 10 if Aoyama.

Regarding claim 3: See Figures.

Regarding claim 5: See the opaque and transparent cases coexist on the wall of the chamber they are both depressurized at the same time.

Regarding claim 6: The prior art of Aoyama et al fails to teach a SiC heater plate. The prior art of Shamouilian et al mentions in col. 4 lines 14-34 that SiC is among the known materials of construction of dielectric member 100 see Figure 1. The motivation to provide plate of SiC is that this material is a known dielectric material having the chemical and physical properties that can withstand the claimed process. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the apparatus of Aoyama et al as modified by Shamouilian et al to use SiC.

Regarding claims 7-10: Aoyama et al further teaches UV glass blocking windows that are part of the opaque

liner, see Figs. 7 (element 20), Fig. 8 (element 18), Fig. 11(lb), Fig. 12 (opaque portions), Figs. 14 and 16 (element 8). The first and second windows are the transparent and opaque portions illustrated in each Figure listed above, see also col. 3 lines 38-65.

Regarding claims 11 and 12: The susceptor and pins (arm portions) of Aoyama are made of transparent quartz according to col. 8 lines 50-64.

Regarding claim 14: Note Aoyama et al briefly illustrates the evacuation of process gases and fails to teach the shape and configuration as claimed.

See Figures of Shamouilian et al, evacuation opening is interpreted as exhaust system 80 which further includes 90 and 85.

The motivation to provide the evacuation opening of Shamouilian et al is that these system and configuration is known to successfully exhaust spent gas and control the pressure of the process gas in the chamber. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the evacuation opening of Shamouilian et al in the apparatus of Aoyama et al.

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyama et al in view of Shamouilian et al and Nath as applied to claims 1-3,5-12, and 14 above, and further in view of Hillman (US 5,997,649).

The teachings of Aoyama et al in view of Shamouilian et al and Nath were discussed above.

The modification fails to teach that the gas injection nozzle unit includes a plurality of injection openings.

The prior art of Hillman teaches a stacked showerhead for delivering gas and RF power to a reaction chamber. The figures of Hillman illustrate the plurality of gas injection openings. The motivation to modify the inlet of Aoyama as combined with the teachings of Shamouilian et al and Nath is that this design allows more uniform distribution of process gas.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

August 4, 2008

/Sylvia R MacArthur/  
Primary Examiner, Art Unit 1792